

10. Jean Hamelin, *Économie et société...*, p. 34.
11. Le greffe de Jacques Voyer, 1802-1812, est une riche source de ces engagements.
12. Fernand Ouellet, *Histoire économique et sociale du Québec, 1760-1850*, Montréal, Fides, 1971, p. 304.
13. Ouellet écrit ainsi «Leur poisson est de qualité médiocre et mal empaqueté. Il ne saurait par conséquent supporter la concurrence extérieure» et encore en parlant des pêcheries, «...elles n'ont pas atteint, dit-on, le degré d'importance qu'elles auraient pu avoir». *Ibid.*, pp. 304-305.
14. Statuts provinciaux du Bas-Québec, 3 Geo. IV, c. 16, 1823.
15. Signifie l'ensemble des parties d'un tonneau qui a été démonté pour l'expédition.
16. Voir 4 Geo. IV, c. 1, 1824; 13 et 14 Vic., c. 43, 1850; 20 Vic. c. 21, 1856; et 37 Vic. c. 45, 1874.
17. Francine Lelièvre, «Histoire humaine au parc national Forillon», ms. non publié, p. 194.
18. Soit celle de Robin Jones & Whitman, à Place Pebiac, qui brûla au mois de juin 1964.

Eileen Marcil

Directory of Canadian Manufacturers, Bicycle Industry, 1880-1984

During the summer of 1984, the National Museum of Science and Technology (N.M.S.T.) conducted a seven-week research project to suggest directions for developing the Museum's bicycle collection, enhance documentation of the existing collections, and gather information for proposed travelling and permanent exhibits. Employment and Immigration Canada's Career Oriented Summer Employment Program provided financial support for the project. The bulk of the research was conducted in Toronto, where most manufacturing has been centred and strong research collections are available.

A wide range of resources was used. The entire run of *Canadian Trade Index (C.T.I.)*, from 1900 to 1984, and The Might Directory Company's *Toronto City Directory (T.C.D.)*, from 1880 to 1984, were consulted to identify manufacturers and obtain basic information about the companies. Recent miscellaneous sporting goods, provincial, and regional directories supplemented this material by indicating small, specialized manufacturers. Cycling magazines from both boom periods, the 1890s and the 1970s, and business magazines from the 1890s and early 1900s provided advertisements and articles about manufacturers and products. The information on turn-of-the-century companies found in the business periodicals was balanced by a significant number of recent newspaper and periodical articles dealing with current industry conditions. These articles were located through *Canadian Periodical Index*, *Canadian Business Periodical Index*, and *Canadian Newspaper Index*.

Certain government publications were helpful. From 1927 to 1959, the Dominion Bureau of Statistics (DBS) issued brief annual surveys of Canadian bicycle imports and domestic production. In addition to providing statistical data, the DBS literature named the year's major manufacturers and cited the aggregate number of employees in the industry. Dates of incorporation were obtained from microfiche listings of incorporated bodies produced by Consumer and Corporate Affairs Canada and the Ontario Ministry of Consumer and Commercial Rela-

tions. The fiche of companies incorporated in Ontario noted both current and dissolved historical corporations; the fiche of federally incorporated companies gave only active or recently dissolved corporations.

Finally, archival and artifactual evidence was consulted. The Public Archives of Canada and the Archives of Ontario had no useful material in their manuscript or photograph collections. The Massey-Ferguson archives, on the other hand, included four catalogues, a photograph, and several clippings and miscellaneous pieces of ephemera related to Massey-Harris bicycles. The N.M.S.T. artifact and catalogue collections were major resources; the Museum's collection of over 100 bicycles and its substantial holdings of catalogues, cycling books,



Fig. 1. Comet bicycle, Comet Cycle Company, Toronto, ca. 1895. The bicycle has a wooden frame with metal components and pneumatic tires. The Comet Cycle Company, a partnership of Thomas Fane (manufacturer of the bicycle in figure 2) and Charles Lavendar, produced metal bicycles as well. (Photo: National Museum of Science and Technology (N.M.S.T.), cat. no. 760670.)

and cycling periodicals constitutes the largest resource of its kind in Canada.

The sporting goods magazines had the major disadvantage of not distinguishing between distributors and manufacturers. Lists of exhibitors at recent Canadian Sporting Goods Association trade shows, published in *Sporting Goods News*, typically noted only company name and product. When data accumulated during the project was amassed and sorted, several but not all of these possible distributors were isolated and omitted from the research files. The advertisements and articles in the magazines also did not always state whether products were Canadian-made (or assembled) or foreign-made.

Incorporation information was also of limited value in determining when companies were active. For example, the Comet Cycle Company, Toronto, was registered as an Ontario partnership in 1897, but contemporary periodical advertisements for the company predate the incorporation by two years. (Figure 1 is a Comet bicycle held in the N.M.S.T. collection.) Dissolution dates were more meaningful than dates of partnership registration or incorporation, but they were more difficult to locate.

The information gathered through the research project was organized into several distinct units. A historical essay outlining the history of bicycle manufacturing in Canada and two discrete groups of factual data were generated. The first of these listings was a directory of approximately 400 Canadian manufacturers of bicycles, bicycle parts and accessories, and bicycle clothing. Entries consisted of manufacturer's name, parent company or subsidiary, dates of appearance in sources, date of incorporation and dissolution, products made, brand names, other products or services offered, president or owner, number of employees, names of foreign agents, illustrations of products and sources, and related material in N.M.S.T. collections. If additional information was available, a brief historical note was added. In many cases, entries do not contain information in all categories. The second listing identifies foreign-made bicycles, bicycle parts, and bicycle accessories sold in Canada. It is based on material found in *The Bicycle* (1882-83), *Canadian Wheelman* (1883-87, 1895-99), and *Massey's Magazine* (1896-97). Names of products and manufacturers and dates of appearance in the sources were supplemented with information from secondary sources.

Although these sources provided a great deal of information, they had a number of limitations. The data culled was disparate and at times contradictory. Years of appearance of companies in *T.C.D.* and *C.T.I.* did not always coincide. Within directories, particularly *T.C.D.*, inconsistencies existed. Periodically a company or individual would be listed as bicycle retailer in the business index, but as a manufacturer in the alphabetical entry. As a result, every reference had to be checked in both listings, a



Fig. 2. Comet bicycle, T. Fane & Company, Toronto, ca. 1887. This brassplated high-wheeler is the earliest example of a Canadian-manufactured bicycle in the N.M.S.T. collection. Fane also sold imported British bicycles. (Photo: N.M.S.T., cat. no. 810208.)

time-consuming process. Errors were also found over a series of volumes of *T.C.D.* The Planet Bicycle Company, Toronto, produced bicycles in the 1920s, but several times throughout the decade the city directories failed to identify the company as a manufacturer. *C.T.I.* listed only major bicycle manufacturers; some of the specialized directories identified significant smaller companies that the larger directory omitted. *C.T.I.* entries were sometimes too vague to be useful. Manufacturers of pneumatic tires for all types of vehicles were grouped together in the business indexes, making it impossible to determine which companies produced bicycle tires. The alphabetical listings were often too general to be of help.

Research indicated that Canadian manufacturing began early in the history of cycling. Bicycles were reportedly built to order in the 1860s and 1870s; in the late 1860s, a homemade bicycle is said to have existed in Fredericton and, in 1878, seventeen-year-old Perry Doolittle, who was to become an avid cyclist and a founder of the Canadian Wheelman's Association, had a wooden bicycle built to his specifications.¹ The first, or one of the first, Canadian manufacturers was Semmens, Ghent & Company, in Burlington, Ontario. As early as 1882, the company was producing nickel-plated or painted bicycles (presumably high-wheelers or ordinaries).² Another early manufacturer was T. Fane & Company of Toronto. (Figure 2 is a Fane Comet ca. 1887.) By the late 1890s, at the peak of the boom, the industry mushroomed. Canadian companies (both Canadian-owned and American branch plants) and numerous individual bicycle makers were producing the popular vehicles. After the boom subsided,



Fig. 3. Massey-Harris Model C bicycle, Massey-Harris Company Limited, Toronto, 1898. A ladies' drop frame bicycle, fitted with Dunlop Detachable Tires made in Toronto. (Photo: N.M.S.T., cat. no. 830366.)



Fig. 4. Berlin bicycle, Arthur Pequegnat, Berlin, Ontario, ca. 1897. A men's diamond frame bicycle, also with Toronto-made Dunlop Detachable Tires. (Photo: N.M.S.T., cat. no. S273.)

manufacturing continued, generally of racing bicycles and, toward the middle of the twentieth century, of children's bicycles and tricycles. In the 1970s, the second boom occurred, sparking another expansion in manufacturing. Mass-produced racing, touring, BMX (bicycle motorcross), and mountain bicycles co-existed with sophisticated custom-made bicycles built by specialized workshops.

The bicycle industry in Canada consistently emerged as a consumer of foreign technology. For example, Massey-Harris bicycles, produced from 1895 to 1899, used patents for the Columbia bicycle held by the Pope Manufacturing Company of Hartford, Connecticut.³ (See Figure 3 for an 1898 Massey-Harris lady's bicycle.) Arthur Pequegnat, a Berlin, Ontario, clock- and bicyclemaker, studied bicycle manufacturing techniques at the Middletown, Ohio, factory of the Miami Cycle and Manufacturing Company.⁴ (Figure 4 is a Pequegnat Berlin bicycle.) In the 1970s, Quebec custom bicyclemaker Giuseppe Marinoni travelled to Italy to observe master craftsmen at work.⁵ Branch plants, established by American companies to circumvent high Canadian tariff barriers, were significant producers in the turn-of-the-century Canadian industry. H.A. Lozier & Company, Toronto Junction, E.C. Stearns & Company, Toronto, and the National Cycle and Automobile Company, Hamilton, were among the better known late-nineteenth-century companies with heavy foreign ties. More recently, the now defunct Sekine Canada Ltd. was initially three-quarters Japanese-owned.⁶ Raw materials have also been imported. English-made steel tubing, like the modern Reynolds 531, has consistently been regarded as an industrial leader. Components, such as hubs, saddles, and brakes, have traditionally been produced abroad in large quantities by cost-efficient foreign companies. The CCM

bicycle in Figure 5 features a number of Italian-made parts, including the world-famous Campagnolo components.

To a far lesser degree, Canada has been an exporter. In the early 1900s, *Industrial Canada* periodically contained trade enquiries from British firms seeking supplies of wooden bicycle rims. The Bowmanville Wood Rim Company, Bowmanville, Ontario, claimed to be producing 600 rims each day in 1897 in order to meet English orders.⁷ Canada Cycle and Motor Company (later CCM)



Fig. 5. Tour du Canada bicycle, CCM, Toronto, ca. 1975. A men's ten-speed model produced by the now dissolved Canadian bicycle manufacturing giant. The Tour du Canada included Campagnolo components, a 3ttt Record handlebar, an Italian-made saddle, and Universal brake components. (Photo: N.M.S.T., cat. no. 750686.)

sold its bicycles abroad soon after its formation in 1899. Australia and South Africa were important markets; for a time, the company also maintained agents in Europe.

Participants in the industry have ranged from small-scale owner-operated businesses to industrial giants like CCM, which had over 1,000 employees in its bicycle and sporting goods divisions by the late 1970s. This variety in size of businesses has been a persistent feature of the industry. It characterized the turn of the century, when individual machinists and large companies like Massey-Harris produced bicycles, and was typical of the 1970s, with custom-made bicycles being produced by individual entrepreneurs at the same time that CCM produced its bicycles in large volumes.

Research also revealed that systems of manufacturers exist, based on the raw materials used in production. Bicycles were produced by machinists, agricultural implement manufacturers, a safe manufacturer, and a clock manufacturer, all of whom used metal extensively in their original lines of production. *C.T.I.* tended to note manufacturers of metal bicycle components in its bicycle parts listings to the virtual exclusion of rubber products, especially bicycle tires. To identify manufacturers of bicycle clothing or items used in bicycle maintenance, different sections of trade directories must be consulted, if indeed data are finely defined enough to uncover bicycle-related products. To some extent, the fragmentation of

information about manufacturers in cycling and related industries in *C.T.I.* is a function of specialized production by use of specific raw materials.

This project is part of ongoing research on cycles at N.M.S.T. For further information on the material accumulated in this study, contact Geoff Rider, Curatorial, Conservation and Research Division, National Museum of Science and Technology, 2380 Lancaster Road, Ottawa, Ontario K1A 0M8, (613) 998-4566.

NOTES

1. David Goss, "Cycling through Atlantic Canada," *Atlantic Advocate* 69 (September 1978): 12; Lyman Hotchkiss Bagg (pseud. Karl Kron), *Ten Thousand Miles on a Bicycle* (New York: Karl Kron, 1887), p. 319.
2. *The Bicycle* 1, no. 2 (November 1882): 6; *The Bicycle* 1, no. 3 (December 1882): 8.
3. Massey-Harris Company Ltd., *The Massey-Harris Wheel for 1896* (Toronto: [1896]).
4. Jane and Costas Varkaris, *The Pequegnat Story: The Family and the Clocks* (Dubuque, Iowa: Kendall/Hunt Publishing Company, 1982), p. 18.
5. Lucien Bailly, "Pour la première fois au Canada!!!," *Canadian Cyclist/Cycliste canadien* 3, no. 1 (March 1975), p. 12.
6. Roger Newman, "Tariff Seen Necessary for Cycle Manufacturers," *Globe and Mail* (13 February 1975).
7. N.a., n.t., *Canadian Wheelman* 14, no. 22 (4 October 1897): n.p.

Anita Rush

Dealing with an Industrial Monument: The Borden Bridge

Introduction

The Borden Bridge is a concrete bowstring arch bridge spanning the North Saskatchewan River fifty kilometres northwest of Saskatoon. Built during 1935-36, the bridge has both engineering features and local importance that make it a significant industrial heritage site.

The concrete bowstring arch bridge was a structural form widely used on Canadian highways from about 1909 until World War II. Most of the spans were less than 150 feet. Possibly the last of this type constructed in Canada, the Borden Bridge with its 213-foot centre span has the distinction of being one of the longest concrete bowstring arch bridges on floating foundations in the world. Designed under the supervision of Chalmers Jack Mackenzie, then Dean of Engineering at the University of Saskatchewan and later President of the National Research Council and Atomic Energy of Canada Limited, the bridge repre-

sents an important achievement by this famous Canadian engineer. Since the bridge design was undertaken at the university it became the subject of additional research by students; this work included photoelastic stress testing, an early application of this technology to structures testing.

On a more local level, the bridge is significant for the people of the area. The bridge site was originally known as the Ceepee ferry and the contract documents issued by the Department of Public Works listed the project as the Ceepee Bridge. However, N.S. Smith, then the enthusiastic mayor of Borden and a prominent local Liberal, managed to convince federal politicians that the bridge should be renamed for the town. (The town itself had been named after Sir Frederick Borden, Minister of Militia in Sir Wilfrid Laurier's cabinet.) Built during the Depression, the bridge was one of many construction projects initiated by the federal and provincial governments